

WHAT IS CLAIMED IS:

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1. A method of forming an integrated circuit, comprising:
forming a dual damascene structure in insulating material over a semiconductor substrate, the dual damascene structure comprising a trench and a contact via extending from a bottom of the trench to expose a conductive element;
depositing a first metal selectively over the conductive element relative to insulating surfaces of the dual damascene structure to partially fill the contact via; and
filling a remainder of the contact via with a second metal, the second metal being more conductive than the first metal.
 2. The method of Claim 1, wherein the first metal comprises tungsten and the second metal comprises aluminum.
 3. The method of Claim 1, wherein depositing comprises a selective chemical vapor deposition.
 4. The method of Claim 3, wherein depositing comprises depositing a ratio of first metal thickness over the conductive element to first metal thickness over insulating surfaces of the dual damascene structure of greater than about 10:1.
 5. The method of Claim 1, wherein filling comprises flowing aluminum at a temperature between about 400°C and 550°C.
 6. The method of Claim 1, wherein depositing the first metal comprises filling the contact via to a height between about one-third and two-thirds of a height of the contact via.
 7. The method of Claim 1, wherein depositing the first metal comprises filling the contact via to a height between about one-half and two-thirds of a height of the contact via.
 8. The method of Claim 1, wherein filling comprises overflowing the contact via to at least partially fill the trench with the second metal.
 9. The method of Claim 8, wherein filling comprises a hot aluminum deposition.
 10. The method of Claim 9, further comprising following the hot aluminum deposition with a cold aluminum deposition.

11. A method for fabricating an integrated circuit interconnect structure, comprising:

etching a pattern of dual damascene trenches and contact vias in insulating material;

preferentially depositing a first metal into the contact vias to partially fill the contact vias; and

depositing a second metal layer by physical vapor deposition to fill a remaining portion of the contact vias over the first metal and at least partially fill the trenches.

12. The method of Claim 11, further comprising depositing a third metal layer by physical vapor deposition over the second metal layer.

13. The method of Claim 12, wherein each of the second and third metal layers comprise aluminum.

14. The method of Claim 11, wherein preferentially depositing comprises filling each contact via to between about one-third and two-thirds of a height of the contact via.

15. The method of Claim 11, wherein the first metal comprises tungsten.

16. The method of Claim 11, wherein preferentially depositing comprises selectively nucleating the first metal on exposed conductive surfaces in the contact vias during a chemical vapor deposition.

17. A method for forming an integrated contact plug, comprising:

forming a dual damascene contact via in insulating material, wherein the dual damascene contact via has a height extending from a conductive element at a bottom of the contact via to a bottom of a dual damascene trench directly over the contact via;

depositing a first metal to fill between about one-thirds and two-thirds of the height of the contact via; and

filling a remainder of the contact via with a second metal, wherein the second metal is more conductive than the first metal and partially fills the trench.

18. The method of Claim 17, wherein depositing comprises filling the contact via to between about one-half and two-thirds of the height of the contact via.

19. The method of Claim 17, wherein the first metal comprises tungsten.

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20. The method of Claim 17, wherein the second metal comprises aluminum.
21. The method of Claim 17, wherein the contact via and the trench are lined with a barrier layer before depositing the first metal.
22. The method of Claim 21, wherein the barrier layer comprises a metal nitride.
23. The method of Claim 17, wherein the contact via and the trench are lined with an adhesion layer before depositing the first metal.

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